

**WHAT IS CLAIMED IS:**

1. A microscope (2) with an optical unit (12) defining an optical axis, comprising:  
at least one objective (22) that can be arranged in the optical axis (16) and is configured as an electron beam objective (28, 42).
2. The microscope (2) as defined in Claim 1, comprising:  
multiple objectives (18, 22) arranged on a revolving nosepiece (20), at least one objective (22) being configured as an electron beam objective (28, 42).
3. The microscope (2) as defined in Claim 1, comprising:  
an electron beam objective (28, 42) comprising an electron microscope column (32) which is arranged in a housing (30) symmetrically about the optical axis (16).
4. The microscope (2) as defined in Claim 3, comprising:  
an electron beam objective (28) forming a hermetic unit with a sample (26) being examined.
5. The microscope (2) as defined in Claim 1, comprising:  
an electron beam objective (42) being spaced slightly away from the surface of a sample (26) being examined whereby approximately ambient air pressure exists between the electron beam objective (42) and the sample (26).
6. The microscope (2) as defined in Claim 5, comprising:  
an electron beam objective (42) comprising a first housing (44) that encloses  
a second housing (48), whereby an electron microscope column (32) is arranged in the second housing (48) symmetrically about the optical axis

(16), and whereby a lower air pressure is existing in the first housing (44) than in the second housing (48).

7. The microscope (2) as defined in Claim 6, comprising:

a first vacuum device,

○ a first connection (45) between the first housing (44) and said first vacuum device,

a further vacuum unit,

and a second connection (49) between the second housing (48) to said further vacuum unit.

8. The microscope (2) as defined in Claim 6, comprising:

○ an first opening (46) of the first housing (44) for transmitting the electron beam, and an second opening (52) of the second housing (48) for transmitting the electron beam, said first opening (46) and said second opening (52) being arranged symmetrically about the optical axis (16).

9. The microscope (2) as defined in Claim 5, comprising:

a single housing (62) of the electron beam objective comprising an opening (64) for the electron beam, said opening (64) being sealed hermetically with a membrane (66) that is transparent to electron beams.

- A 10. The microscope (2) as defined in <sup>Claim 1</sup> ~~one of the foregoing claims~~, comprising:  
an electron beam objectives (28, 42, 60) having a length that is comparable to the length of conventional objectives for light microscopes.